Semantic Emergence From Social Tagging Systems

Mohammed Alruqimi, Abdelmalek Essaadi University, Tetouan, Morocco
Noura Aknin, Abdelmalek Essaadi University, Tetouan, Morocco

ABSTRACT

Recently, Social tagging systems (folksonomies) have become very popular platforms where content is created collaboratively by users. This kind of environments allows users to assign shared resources with freely chosen keywords (tags). Folksonomies provide a valuable addition to the knowledge organization methods since they allow users to choose vocabularies that meet their real tastes and cognition. However, the lacking of standardization and the flat structure of tags in folksonomies pose challenges for folksonomy searching and information retrieval. Several researches have been proposed to overcome these drawbacks. In this paper, the authors present, describe and compare the most relevant approaches to capturing hidden semantics in folksonomies and turning it into ontologies. The authors also present and describe many techniques, tools and online resources that can be useful in working on such systems. Finally, the authors propose an approach to extract ontology from social tagging systems.

Keywords: DBedia, Folksonomy, Knowledge Discovery, Ontology, Semantic, Social Tagging, Tag Co-Occurrence, WordNet

DOI: 10.4018/IJOCI.2015010102
INTRODUCTION

Organization of resources on the web has become a major challenge. Recently, Social collaborative tagging systems have emerged as an environment for users to organize and share such resources, where users label shared resources by using freely chosen vocabularies. Results of this collaborative tagging activity in these systems generate a user-generated classification called folksonomy. In the last years, social tagging systems on the web, such as Delicious for sharing bookmarks, Flickr for sharing photos, CiteULike for sharing scholarly papers, and YouTube for sharing videos have been enjoying exponentially growing numbers of subscribers since their relatively recent inception, and they are covering a wide range of resources and communities with a huge number of participants. (Trabelsi et al, 2010) However, the lacking of standardization and the flat and non-structure organization of tags in folksonomies pose challenges for folksonomy searching and information retrieval. Several researches have been introduced in order to overcome these drawbacks and many solutions have been proposed (such as tags clustering, tags cloud or turning folksonomy into ontology). In this paper, we review, discuss and compare the most relevant approaches which attempt to make explicit the semantics behind the tag space in social tagging systems.

SOCIAL TAGGING SYSTEMS (FOLKSONOMIES)

Folksonomy is a user-generated classification system of web contents. It is also known as collaborative tagging and social tagging. Folksonomy-base systems allow users to tag web resources (videos, images, links and etc.) with their chosen words or phrases. Social tagging systems consist of at least three set of elements: tagger, digital objects and tags. Taggers are the persons who interact within the closed community. Digital objects are the shared resources, and tags which are used for describing shared resources. (Thielen, et al, 2010)

Folksonomy term is coined by Thomas Vander Wal, derived from folk and taxonomy. Vander Wal identified two types of folksonomy: broad and narrow. In broad folksonomy (such as Delicious), many users tag particular content with their own vocabularies, thus creating a greater amount of metadata for that content. In narrow folksonomy (such as Flicker), few users tag an object with a limited number of terms which used to get back to the object. (Vander Wal, 2005)

Definition 1:
A folksonomy is a tuple $F = (U, T, R, Y)$ where:
$U$ is a finite set of users,
$T$ is a finite set of tags,
$R$ is a finite set of resources, and $Y$ is a ternary relation between them, i. e., $Y \subseteq U \times T \times R$, whose elements are called tag assignments.
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